

sole heir of Dr. W. J. Pöpel<sup>2)</sup>). As stated by Declarants, the embodiment of the process for the preparation of a methanol reforming catalyst which is disclosed in the paragraph on page 7, indicated lines 8 to 10, of copending U.S. application Serial No. 10/090,763<sup>3)</sup>, in which process a calcined catalyst precursor is first reduced, then passivated, and subsequently shaped, as well as the catalyst obtained in that manner, was the contribution of Drs. M. Hölzle, M. J. Sprague and K. Harth.

As such, the invention disclosed and claimed in the present application was not made by another and the provisions of Section 102(f), and correspondingly Section 103(a), are not applicable. Favorable reconsideration of the Examiner's position and withdrawal of the respective rejections is therefore respectfully solicited.

The Examiner further rejected Claims 1 to 14 under the judicially created doctrine of obviousness-type double patenting as being unpatentable in light of Claims 1 to 7 and 9 of *Hölzle et al.*'s copending application *Serial No. 10/090,763*.

The determination of obviousness-type double patenting essentially involves a determination of non-obviousness under 35 U.S.C. §103, with the exception that the patent disclosure is not applicable as "prior art"<sup>4)</sup> and, corresponding to a determination of obviousness under Section 103, the *invention as a whole*<sup>5)</sup> must be considered when an analysis of obviousness-type double patenting is made.

As already submitted by applicants in their previous reply, the invention disclosed and claimed in the present application relates to a catalyst which is obtained by

- (1) precipitating or spray-drying a mixture of catalyst precursor components dissolved or suspended in a diluent in order to form a solid catalyst precursor in the form of powder or granules,
- (2) calcining and reducing the solid catalyst precursor obtained in stage (1),
- (3) passivating the reduced catalyst precursor obtained in stage (2) and

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2) A certified copy of the Certificate of Inheritance as well as a certified translation thereof is enclosed with the Declaration.

3) Corresponding to the first part of para. [0040] on page 3 of *US 2002/0169075*.

4) Cf. *In re Braat*, 937 F.2d 589, 594, 19 USPQ2d 1289, 1293 (CAFC 1991); *In re Vogel*, 422 F.2d 438, 441-42, 164 USPQ 619, 622 (CCPA 1970).

5) *In re Antonie*, 559 F.2d 618, 620, 195 USPQ 6, 8 (CCPA 1977).

- (4) shaping the passivated catalyst precursor obtained in stage (3) to form the catalyst.

Accordingly, a precursor powder or granulate is first calcined, then the calcined intermediate is reduced and subsequently the reduced intermediate is passivated. Only after the precursor powder or granulate has been pre-treated in the requisite manner (stages (1) to (3)) the catalyst is formed. More particularly, applicants have found that a catalyst which is prepared in the specified manner exhibits particular properties which are not found in a catalyst obtained by calcining a precursor powder or granulate and subsequently shaping the calcined precursor. The distinct and significant impact on the catalysts properties which results from the particular manner in which applicants' catalyst is obtained is illustrated by the experiments summarized on pages 13 to 16 of the application.

In Example 1<sup>6)</sup> which illustrates applicants' invention an initial Cu catalyst precursor was first calcined, then reduced and subsequently passivated before it was shaped to tablets. For comparison purposes, the calcined initial Cu catalyst precursor was shaped to tablets without a prior reduction and passivation stage in comparative Example 1<sup>7)</sup>. The properties of the catalysts obtained in Example 1 and in Comparative Example 1 were then investigated in a methanol reforming process<sup>8)</sup>. The catalyst test showed that the catalyst of Example 1 suffered a loss of compressive strength from an initial value of 39.5 N/tablet to 34.2 N/tablet, corresponding to 5.3 N/tablet, whereas the catalyst of **Comparative Example 1** suffered a loss of compressive strength from an initial value of 51.0 N/tablet to 7.4 N/tablet, corresponding to **43.6 N/tablet**. The catalyst according to applicants' invention is, accordingly, by far less prone to loose compressive strength than the comparative catalyst. In addition to the distinct improvement of the compressive strength of the catalyst which is achieved in accordance with applicants' invention, applicants' catalyst also has a distinct advantage over the comparative catalyst where the volume shrinkage is concerned. While the catalyst of Example 1 suffered a volume shrinkage of 12.5%, the catalyst of **Comparative Example 1** suffered a volume shrinkage of **22.4%**.

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6) Cf. page 13, indicated line 20, to page 14, indicated line 11, of the application.

7) Cf. page 14, indicated lines 13 to 25, of the application.

8) Cf. page 14, indicated line 27, of page 15, indicated line 5, of the application.

For the comparison in Comparative Example 2<sup>9)</sup>, applicants repeatedly passivated and reduced the catalyst of **Comparative Example 1**. before the comparative catalyst was employed in the methanol reforming process. The comparative catalyst employed in Comparative Example 2 was, accordingly, obtained by first calcining the precursor, then shaping the calcined precursor to tablets and subsequently reducing and passivating the tablets. The comparative catalyst which was obtained in that manner exhibited a compressive strength of only 3.5 N/tablet, as compared to the compressive strength of 39.5 N/tablet exhibited by catalyst of Example 1 representing applicants' invention.

When the comparative catalyst and the catalyst according to applicants' invention as illustrated in Example 1 were tested for their stability in the methanol reforming process, the compressive strength of the comparative catalyst was further reduced to 2.4 N/tablet, corresponding to a loss of compressive strength of about 32%, whereas the compressive strength of the catalyst of Example 1 was reduced to 34.2 N/tablet, corresponding to a loss of compressive strength of about 14%.

In contrast to applicants' invention which provides for an improvement of the catalyst compressive strength by employing specific procedure steps in a particular order, **Hölzle et al.**'s copending application **Serial No. 10/090,763** relates to a catalyst wherein the hardness is adapted by means of controlling the anion content of the catalyst<sup>10)</sup>. With regard to the provisions in Claim 1 of copending application **Serial No. 10/090,763** "shaping and, if required, reducing and passivating the calcined catalyst precursor from stage (ii)" may be conducted "in any desired order". Correspondingly, co-pending application **Serial No. 10/090,763** explains in the second paragraph on page 7

*the calcined catalyst precursor from stage (ii) can first additionally be reduces, then passivated and then subjected to the shaping process. It is also possible for the calcined catalyst precursor from stage (ii) first to be subjected to the shaping process and then to be reduced, the catalyst obtained often no longer being pyrophoric and it therefore being possible to dispense with passivation.*

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9) Cf. page 15, indicated line 6, to page 16, indicated line 5, of the application.

10) Cf. page 7, para 1, of co-pending application **Serial No. 10/090,763**.

According to the teaching of co-pending application **Serial No. 10/090,763** it is therefore not critical at which stage of the catalyst preparation a reduction and subsequent passivation is conducted, and a person of ordinary skill would expect that the point in the preparation of the catalyst at which the reduction and passivation is conducted is of no consequence with regard to the catalyst properties. Co-pending application **Serial No. 10/090,763** therefore clearly falls short from rendering it obvious to a person of ordinary skill in the art that the order in which the catalyst precursor is calcined shaped, reduced and passivated is critical with regard to the catalysts compressive strength. Applicants' invention as a whole is, therefore, not rendered prima facie obvious by the claims and/or the disclosure in co-pending application **Serial No. 10/090,763**. Favorable reconsideration of the Examiner's position and withdrawal of the provisional obviousness-type double patenting rejection is therefore respectfully solicited.

REQUEST FOR EXTENSION OF TIME:

It is respectfully requested that a two month extension of time be granted in this case. A check covering the \$430.00 fee is attached.

Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees, to Deposit Account No. 11.0345. Please credit any excess fees to such deposit account.

Respectfully submitted,

KEIL & WEINKAUF



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Encl.: Declaration pursuant to Rule 312

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